

## Clinical Module 11 – Malnutrition

### Module 11 Questions:

#### I. Definitions

**Cachexia** – characterized by weight loss, muscle and fat loss, fatigue, weakness, and loss of appetite due to severe chronic illness.

**Catabolism** – breakdown of energy. Breakdown of complex molecules (starch, protein, fats) to simpler ones (amino acids, etc).

**Cheilosis** – Inflammation and/or cracking of the corners of the mouth.

**Cytokines** – Proteins that are released by cells that have a specific effect how other cells communicate with each other.

**Sarcopenia** – loss of muscle tissue. This happens with aging.

#### II. Anatomy/Physiology

1. Describe the process of carrying out a nutrition focused physical examination. What characteristics are indicative of malnutrition?

During a nutrition focused physical examination, the RD will examine the patient from head-to-toe to look for any signs of malnutrition, nutrient deficiencies, and nutrient toxicities. Before examination can begin, the RD must first ask the patient for permission to conduct the examination. Once permission has been granted the RD can begin the physical examination.

Some characteristics that are indicative of malnutrition include:

- Fat and muscle loss
  - Hollows, depressions, or loose skin around the eyes
  - Prominent clavicle bones or bony shoulders
  - Fat loss at triceps
  - A depression in the muscle between the thumb and forefinger on the back of the hand when the patient presses their thumb and forefinger together.
  - Visible bones in the torso
  - Depression between the ribs and shoulder blades or the shoulders and spine.
- Muscle loss
  - Depression or pit at the temples
  - Minimal muscle in the quadriceps and calf.
  - Bony knees
  - Depression in the thigh area
- Pitting edema (pressing a part of the body and a depression remains) in the lower extremities can be another sign of malnutrition.

### **III. Pathophysiology**

1. Describe the relationship between serum protein levels and nutritional status.

Serum proteins like prealbumin and albumin have long been used to determine the nutritional status of an individual. When serum protein levels are low, tissue catabolism (breakdown) begins which leads to wasting, affecting cytokine response, affecting immune cell functioning, and nervous system breakdown.

2. How does malnutrition contribute to edema?

Edema is the buildup of extra fluid in the cavities or tissues of the body. When someone has very low protein levels, edema can occur. One of the jobs of proteins in the body is to help hold salt and water inside the blood vessels so that no fluid can escape to the tissues outside. Therefore, if an individual doesn't consume enough protein, there will be no protein molecules to hold the salt and the water which will cause them to leak out which results in edema.

3. What are the metabolic differences between malnutrition related to chronic diseases as compared to simple lack of food?

In chronic disease related malnutrition, there is chronic inflammation occurring between a mild to moderate degree. An example of this is organ failure, pancreatic cancer, or rheumatoid arthritis. On the other hand, starvation related malnutrition occurs when the body is chronically starved, but no inflammation occurs. An example of this is anorexia nervosa.

### **IV. Nutritional Management**

1. Describe three ways in which advocacy and policy decisions can impact malnutrition in developing and developed countries. How are these similar? How are they different?

- Addressing food insecurity
  - In developed countries like the United States, there are programs that address the problem of food insecurity such as SNAP. There are food programs that address food insecurity in different populations (children, families, and elderly). In the United States, government and non-profit organizations provide food items to individuals to ensure that they do not go hungry. On the other hand, developing countries may have nutrition assistance programs put together by the government or non-profit organizations but they may not be as efficient and may not be able to reach everyone who is food insecure. This may be due to the location of food insecure individuals or it may even depend if the government regulates where food items will go to help people.
- Poor water / Sanitation
  - Without an adequate clean water supply, individuals can die from dehydration or contract disease from drinking water from contaminated sources. In developing countries, poor water and sanitation is not a major issue for most of the population. However, in underdeveloped or developing countries, poverty and corruption may be the root cause as to why people do not have access to potable

- water. Although there are organizations who seek to bring clean drinking water to places in the world where this is an issue, there is still a lot of work to be done.
- Health Services
    - Unfortunately, healthcare continues to be an issue even in developed countries. There are developed countries which provides free universal healthcare to all of their citizens. For individuals who are malnourished, free healthcare ensures that that they will be able to seek the medical assistance they needed in order to recover. On the other hand, for malnourished individuals with no access to free healthcare, seeking treatment for complications arising from malnutrition is more difficult. Malnourished individuals may not even be willing to seek medical attention.

2. What role is the most appropriate role for enteral or parenteral nutrition support with nutrition related to chronic disease?

Enteral and parenteral nutrition is given to those who are under nutritional risk and who have inadequate food intake. Enteral nutrition is indicated when a patient has a functioning GI tract but eating by mouth is inadequate or unsafe, when a patient is malnourished, when a patient has trouble swallowing, patient has major trauma, and a patient with severe malnourishment before surgery.

Indications for parenteral nutrition use includes an inaccessible GI tract, short bowel syndrome, non-operative bowel obstruction, multiple fistulas near the feeding tube placement, and a paralytic ileus.

Both forms of nutrition support can be extremely helpful to ensure that an individual with chronic illness receives the proper calories and other nutrients to allow maintenance of physical well-being and as close to normal body function.